Learning Project 6 Fractions, Proportions and Percents

Inquiry Activity 6-4: Multi-step Problems and Percents

(Note: Italicized portions should be directed to learners.)

1. Identifying the Problem: (Item # 10, PA) Calculator allowed

Read the question carefully, as you would if taking the actual test.

Calculator Allowed

10. Juanita had her car windshield replaced at a cost of $250. After a $50 deductible is applied (i.e., Juanita pays the first $50), her insurance company will pay 80 percent of the remaining balance. In dollars, how much will the company pay?

PLEASE DO NOT WRITE IN THIS TEST BOOKLET.

Mark your answer in the circles in the grid on your answer sheet.

Here are some problem clarification questions you may want to consider when reading test questions.

What words and/or symbols might be important to understand to answer this problem and what are they telling you?

The following, among others, are possibilities: deductible, remaining balance.

What words and/or symbols are unfamiliar and what do you think they mean?

2. Becoming Familiar with the Problem

Ask yourself questions like these about the problem, taking note of the ones that were especially helpful so that you can remember to use them when you take the test.

Reread the question. What is the question really asking?

Which information in the problem is relevant to what you need to find?

What do you know about insurance policies with a deductible?

What will the answer look like; will it be a percent or dollars?

3. Planning, Assigning and Performing Tasks

Try to answer the test question any way you can, even it you have to guess, but try to be aware of the reasoning and operations that you are using. The following directions and questions can be helpful.

Use your experience with similar problems to make sense of this one.

Restate the problem using fewer words.

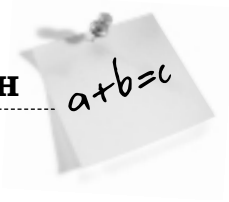
What math operations are involved with deductibles?

Break the problem down into parts.

Estimate an answer and be aware of the steps you used to estimate.

Do the work to find an answer.

Can the calculator help you find an answer?



Is the answer reasonable?

Compare your answer to your estimation.

Mark your answer on the answer grid.

Be ready to defend your answer (whether you worked individually or with someone else) and the way you found it.

4. Sharing with Others: Class Discussion of Results

Telling other people what you know helps you to understand the material better. So take this opportunity not only to share your knowledge, but also to learn it more completely.

***Small groups**: Compare your answer to others in the group and explain why and how you found it and why you think it is correct.*

Agree on how the problem can be broken down into smaller, more manageable steps.

Agree on the correct answer and the step-by-step process used to find that answer.

Most will subtract $50 from 250 first so the second step will be to find 80% of 200. It is on the second step where you will see many different procedures.

Explain how the calculator can help in the solution of the problem.

Do some research in the math texts and find at least two different examples of how to do this kind of a percent problem. Be sure to cite the text name and page number that you used.

***Whole Class:** Report to the class your determinations of the steps you decided on to answer this question and the estimation process used.*

At the completion of all the group presentations, the class should review the text book explanations of how to perform this kind of percentage problem.

They will probably find both the proportion method and the equation method using either fractions or decimals. It is likely that neither of these will be the way that they first found the answer. Encourage them to compare.

Discuss the different ways the correct answer can be correctly entered into the answer grid.

5. Reflecting, Extending and Evaluating

Reflecting: Think about what you learned.

Here are some questions to start you thinking about the experience you just had. Thinking about what you have learned and experienced is part of the learning process. When the focus is only on the answer, you don't get much time to think about what was learned.

How many different ways were presented to solve this problem? What were they?

How do most of the procedures used show an understanding of percents?

This is a good opportunity to examine the different thought processes used to solve this problem– some may have thought that 10% of 200 is 20 and then multiplied that by 8 to get 160. Others may have thought that 80% of 100 is 80 and doubling that is 160. Some may have used the analogy idea and puzzled it out. Some may have used the calculator with the percent key. Others will have just multiplied 80 by 200, realized the answer was too large, and then moved the decimal point. It is critical at this point for the teacher to reconcile all of these procedures, pointing out that most of them show that they do understand percents in some way. The message should be the underlying idea of percents that all of them show, not that there is one or even two ways to do this problem.

How did breaking up the problem into smaller steps help you to come up with an answer?

How did you know what math to perform at each of the different steps?

Extending: Extend what you learned to new situations.

In extending, you are being asked to transfer the information presented in the Practice Test question to other information or situations you already know and maybe make new connections to other information.

There are many extension questions that follow. You can pick the ones that your class may be ready for and eliminate others.

Connect this problem to what you learned in other Learning Projects:

Explain how the proportions that you studied in Inquiry Activities 6-1 through 6-3 are relevant to percent problems?

How is this math situation similar to the questions in Inquiry Activities 2-1 and 2-2 in the Rates Learning Project?

Be prepared to reinforce learner's insights into connections to other math.

How is it different?

Explain how a percent problem can be solved using the algebra ideas you learned in both Algebra Learning Projects?

Can use a template approach. Rate x Base = amount. Have to solve for whichever is the unknown.

Solve other problems in ways that may not be textbook related. Your instructor will break you up into groups. Each group is to perform the following tasks:

These questions about this particular item should have already been discussed in the Reflect stage. Now they should be looking at other problems and making decisions as to what method they like best for other problems that may be more or less complicated. Find some examples that you think would be good.

Come up with as many different ways as possible to solve this other problem. Make sure that the group shows all the steps in these other solutions.

Compare all the approaches and determine which is the most efficient way to solve the problem.

Compare all the approaches and determine which way you would use to solve a similar problem on the GED test.

Expand on what you know about the situation indicated in the problem (insurance, deductibles, and percent of coverage) and also to transfer the math learned to other situations in which the math may be used.

Discuss other insurance situations that are similar to the one presented in the problem.

Discuss how to use the math used in this problem in those other situations.

List other situations (not insurance) in which the math can be used and determine how to use the math in those other situations.

Evaluating: Assess what you learned and how you learned it.

In this last step, you get a chance to review both the content of what you learned and the methods used to learn. There are no right or wrong answers to these questions; it is your chance to look more closely at your learning style and the opportunity to state how you benefited or didn't benefit from the content and/or the methods to help you pass the GED test.

What strengths of mine were apparent during this Inquiry Activity on percents?

What weaknesses of were exposed and how can I overcome them?

Which questions or strategies in the first three steps were most helpful to you? Explain.

Does having test-taking strategies to use help reduce math anxiety? Explain.